

REMARKS

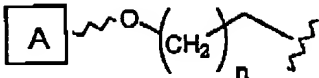
Applicant thanks the Examiner for her careful consideration of this case.

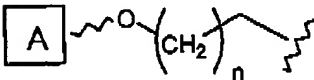
Claims 56, 58-62, 65-67, 69-76, 78-81, 84-86 and 88-98 are currently pending in the application. Claims 56, 58-62, 69, 76, 78-81, 88-90, 97 and 98 are rejected under 35 U.S.C. § 102(a) and/or 102(b) over Danishefsky *et al.* (Angew. Chem. Int. Ed., 2000, 39, pp. 836-863), WO 99/48515 and Toyokuni *et al.* (Chemical Society Reviews, 1995, 24, pp. 321-242). In addition, the claims are provisionally rejected under the judicially created doctrine of obviousness-type double patenting over co-pending application Nos.: 10/209,618 and 10/728,041.

In an effort to expedite prosecution of a portion of their invention of particular current interest, Applicant has presented a set of amended claims on pages 2-20 of this paper.

Amendments to the Claims

Claims 56, 61, 62, 67, 74, 76, 81 and 93 have been amended. Claims 58-60, 65-66, 69-73, 75, 78-80, 84-86, 88-92 and 94-98 remain unchanged. Applicant respectfully submits that no new matter is added through the proposed amendment to the claims. The proposed amendments are fully supported by the specification and claims, as originally filed. Specifically, claims 56, 62, 67,

74, 76, 81 and 93, as amended, recite  as the alkyl glycosidic moiety wherein n is 1-8. Support for this amendment can be found throughout the specification, for example, line 25 page 33, line 9 page 35, line 21 page 36 and line 12 page 38 where the moiety

 is depicted. Further support can be found, for example, at line 17 p. 11, line 9 p. 35, line 11 p. 38, where n is defined as an integer from 0-8. Support for n ranging between 1 and 8 can be found, for example, at lines 20-23 page 35 of the specification where one aspect of the invention is identified as encompassing clustered glycopeptides where n is greater than or equal to 1.

Claim 61, as amended, recites n = 1-8. As discussed above, support for n ranging from 1-8 can be found, for example, at line 17 p. 11, line 9 p. 35, line 11 p. 38 and lines 20-23 page 35 of the specification.

In addition, claims 56, 61, 62, 76 and 81 have been amended to correct the value of the sums l and k, and s and u, in light of the fact that the v and w bracketed structures represent pyranose moieties.

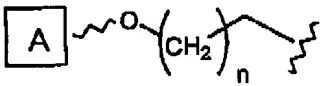
Furthermore, claims 56, 62, 74, 76, 81 and 93 recite that "at least one occurrence of A has a different structure from other occurrences of A." This language is fully supported by the specification as filed. For example, support can be found at lines 20-23 p. 35 of the specification in the teaching that n-alkyl linked (where n is greater than or equal to 1) clustered glycopeptides *may incorporate multiple antigenic structures* or may also incorporate all of the same antigenic structures. Further support can be found, for example, in Figure 16 (Compound 54).

No new matter is being introduced by these amendments. Applicant is submitting the present amendments without prejudice to the subsequent prosecution of claims to some or all of the subject matter which might be lost by virtue of this paper, and explicitly reserves the right to pursue the subject matter of any of the canceled claims, or some or all of the subject matter which might be lost by virtue of this paper, in Divisional or Continuation Applications.

Below we address each of the rejections stated in the Office Action as if it were applied to the newly amended claims.

1. Rejections under 35 U.S.C. § 102

A. The Examiner has rejected claims 56, 58-61, 69, 76, 78-80, 88, 97 and 98 under 35 U.S.C. § 102 (a) as being anticipated by Danishefsky *et al.* (Angew. Chem. Int. Ed., 2000, **39**, pp. 836-863). Specifically, the Examiner points to the structures on pages 855-859 of the cited reference and states that they anticipate the instant claims. The claims, as amended, recite an alkyl glycosidic

moiety having the structure  where n is 1-8. Accordingly, in the claimed glycopeptides, two carbon atoms separate the carbohydrate determinant A and the peptidic backbone. In addition, in the claimed multi-antigenic glycopeptides, at least one occurrence of the antigenic structure A has a different structure from other occurrences of A. As the Examiner noted, the glycopeptides of pages 855-859 of the cited reference, the antigen-bearing amino acid residues are substituted with a glycosidic moiety having the structure A-O-, which is attached to the peptidic backbone through one carbon atom. Furthermore, in the glycopeptides disclosed in the cited reference, each occurrence of A is the same. Accordingly, the cited reference cannot anticipate the present claims.

B. The Examiner has rejected claims 56, 58, 62, 69, 76, 78-81 and 88-90 under 35 U.S.C. § 102 (a) as being anticipated by WO 99/48515. Specifically, the Examiner points to compounds 3, 4 and 5 in Figure 20 of the cited reference (citing Figures 20A and 20C), and states that they anticipate the

instant claims. The glycopeptides referred to by the Examiner, the antigen-bearing amino acid residues are substituted with a glycosidic moiety having the structure A-O-, which is attached to the peptidic backbone through one carbon atom. Furthermore, in the glycopeptides disclosed in the cited reference, each occurrence of A is the same. As discussed above, these glycopeptides are specifically excluded from the instant claims because n cannot be 0, and because in the claimed multi-antigenic glycopeptides, at least one occurrence of the antigenic structure A has a different structure from other occurrences of A. Accordingly, the cited reference cannot anticipate the present claims.

C. The Examiner has rejected claims 56, 61, 69, 76 and 78 under 35 U.S.C. § 102 (b) as being anticipated by Toyokuni *et al.* (Chemical Society Reviews, 1995, 24, pp. 321-242). Specifically, the Examiner points to compound 19 in Scheme 11 of the cited reference, and states that it anticipates the instant claims. The glycopeptides referred to by the Examiner, the antigen-bearing amino acid residues are substituted with a glycosidic moiety having the structure A-O-, which is attached to the peptidic backbone through one carbon atom. Furthermore, in the glycopeptides disclosed in the cited reference, each occurrence of A is the same. As discussed above, these glycopeptides are specifically excluded from the instant claims because n cannot be 0, and because in the claimed multi-antigenic glycopeptides, at least one occurrence of the antigenic structure A has a different structure from other occurrences of A. Accordingly, the cited reference cannot anticipate the present claims.

The instant claims are directed to multi-antigenic glycopeptides comprising two or more glycosidic moieties A-O-(CH₂)_n-CH₂-, wherein at least one occurrence of A has a different structure from other occurrences of A. Because the claimed glycopeptides comprise more than one type of carbohydrate antigen, they have superior properties over the glycopeptides disclosed in the cited art. It is well established that transformed cancerous cells exhibit abnormal cell surface glycosylation patterns. As stated in the specification, identified cancer carbohydrate antigens such as TF, Tn, sTN, KH-1, Le^y and Globo-H have been carefully characterized as being over-expressed at the surface of malignant cells in a variety of cancers (breast, colon, prostate, ovarian, liver, small cell lung and adenocarcinomas). Thus, the claimed glycopeptides have superior immunotherapeutic properties than the cited prior art glycopeptides, in that a single claimed glycopeptide can induce the production of more than one type of antibodies (*i.e.*, antibodies against the two or more types of

carbohydrate antigens present on the glycopeptide). For the convenience of the Examiner, Applicant has provided herewith copies of several publications demonstrating that multi-antigenic glycopeptides such as those claimed in the instant application can be used to induce antibodies against individual carbohydrate antigens present on the glycopeptide, which antibodies are reactive with one or more cancer cell lines expressing these antigens. See, for example, Ragupathi *et al.*, *J. Am. Chem. Soc.*, (2006), 128, 2715-2725.

Copies of publications provided:

1. Allen *et al.*, *J. Am. Chem. Soc.*, (2001), 123, 1890-1897.
2. Ragupathi *et al.*, *PNAS*, (2002), 99(21), 13699-13704.
3. Keding *et al.*, *PNAS*, (2004), 101(33), 11937-11942.
4. Ragupathi *et al.*, *J. Am. Chem. Soc.*, (2006), 128, 2715-2725.

2. Provisional Obviousness-type Double Patenting Rejection

The Examiner has provisionally rejected claims 56, 58-62, 65-67, 69-76, 78-81, 84-86 and 88-98 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 118-198 of co-pending application No.: 10/209,618 and claims 1-36 of co-pending application No.: 10/728,041. The Examiner states that the claims in the cited applications anticipate the instant claims (see page 8 of the Office Action mailed 10/12/2005).

Applicant notes that co-pending application No.: 10/728,041 filed December 3, 2003 is a continuation-in-part of co-pending patent application No.: 10/209,618 filed July 31, 2002; which is a continuation-in-part of the present application. Therefore, the '041 and '618 applications do not have an earlier effective filing date than the present application. Accordingly, the claims in the '041 and '618 applications cannot anticipate the present claims.

Applicant respectfully refrains from further commenting on this provisional rejection unless and until such time as it matures into an actual rejection. Application serial numbers 10/209,618 and 10/728,041 and the instant application are assigned to the same entity. Once application serial number 10/209,618 and/or 10/728,041 has been allowed, and if the allowed claims in 10/209,618 and/or 10/728,041 are not deemed patentably distinct from the allowed claims in the instant application, Applicant is prepared to file a terminal disclaimer in application serial number 10/209,618 and/or 10/728,041.

CONCLUSION

Applicant thanks Examiner Canella for her time and consideration. In light of the foregoing Remarks, Applicant respectfully submits that the present application is in condition for allowance; a Notice to that effect is respectfully requested.

If a telephone conversation would help clarify any issues, or help expedite prosecution of this case, Applicant invites the Examiner to contact the undersigned at (617) 248-5150.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those which may otherwise be provided for in documents accompanying this paper. However, in the event that any additional fees are required for consideration of this paper (including fees for net addition of claims), these fees are authorized to be charged to our Deposit Account No. 03-1721.

Respectfully submitted,
CHOATE, HALL & STEWART LLP



Nadège M. Lagneau, Ph.D.
Reg. No.: 51,908

Date: June 23, 2006

PATENT GROUP
CHOATE, HALL & STEWART, LLP
Two International Place
Boston, MA 02110
Telephone: 617-248-5150
Facsimile: 617-248-4000